DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name: **The Ensign-Bickford Company**
Facility Address: **8305 South Highway 6, Spanish Fork, Utah 84660-0310**
Facility EPA ID #: **UTD041310962**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

__**Yes**_ If yes - check here and continue with #2 below.

_____ If no - re-evaluate existing data, or

_____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "level" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	_x_	___	___	**Groundwater is contaminated with RDX, PETN, ...**
Air (indoors)[2]	___	_x_	___	**Airborne may be in production areas (OSHA)**
Surface Soil (e.g., <2 ft)		_x_	___	___ **44 SWMUs on site, many contaminated**
Surface Water	___	_x_	__	**SWMU 16, a small ephemeral pond, most times dry**
Sediment	___	_x_	___	**SWMU 16, contamination below risk-levels**
Subsurf. Soil (e.g., >2 ft)	_y_		___	__ **PETN, RDX, TNT, etc. and hydrocarbons**
Air (outdoors)	___	_x__		

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "level" are not exceeded.

__x__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "level" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "level" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

Rationale and Reference(s):

There are two significantly different potential human receptors, namely, on-site workers and off-site residents, who are potentially exposed to the contaminated media caused by waste releases at the EBCO facility. On-site and off-site contaminations are addressed by the following two different programs: (1) the Utah Division of Solid and Hazardous Waste (DSHW) is overseeing the on-site RCRA Facility Investigation (RFI), and (2) the Utah Division of Water Quality is responsible for the oversight of off-site groundwater contamination that was initiated years before RFI activities. Therefore, the rationale and references for this EI are focused on the two different human receptors.

1) On-site: RCRA Facility Investigation (RFI) Activities

The Ensign-Bickford Company (EBCO) continues to conduct RFI activities following the Final Revised RFI work plan approved by the Utah Division of Solid and Hazardous Waste (DSHW) in June 1999 in accordance with Stipulation and Consent Agreement No. 9412069 between EBCO and DSHW (representing Utah Solid and Hazardous Waste Control Board). The RFI activities include the following: a) Investigate the nature and extent of known and suspected releases of hazardous wastes and hazardous waste constituents and identify potential source areas to the regional groundwater contamination; b) Evaluate the risks associated with any contamination; and c) Develop appropriate site management options including methods for cleaning up contamination at the facility.

The on-site soil and installation of groundwater monitoring wells has largely been completed. Sampling results indicate that many SWMUs have been impacted with constituents of energetic materials (CEMs) or explosive constituents (e.g., TNT, PETN, RDX, HMX, NG, etc.), lead, or some organic compounds associated with petroleum hydrocarbons and laboratory solvents. Lesser amounts of other compounds such as lead and certain solvents have also been found in soil, but typically not in ground water.

The most significant source of contaminants was the waste water discharge from various former explosive manufacturing areas into unlined surface impoundments, especially the north dispersion area (SWMU 1), and the former manufacturing complexes (SWMUs 26 and 30), and lined acid ponds (SWMU 3). Some of the SWMUs are believed to have contributed to the explosive contamination found in the regional aquifer, primarily off-site.

Surface soils at several of the SWMUs contain elevated levels of various contaminants that exceed the site-specific industrial risk levels, or risk-based screening levels (RBSLs) developed in the RFI work plan. According to the work plan, all these areas will need to be remediated or managed to ensure contaminants in environmental media will not pose a risk to on-site workers.

The only surface water and sediment contamination present was at SWMU 16, which consists of a small former QC Test Pond (approximately 40' x 40') where explosives products were historically tested. The QC Test Pond is ephemeral and dry at most times. EBCO stopped testing its product in the pond several years ago. The pond has been dry the last several years. RFI analytical results report low concentrations of CEMs in surface and subsurface soils below the base of the pond. These samples were collected when the pond was dry. When the pond was wet, these soils could be interpreted to be sediment. However, for evaluating human health risks, soils on the pond bottom are best characterized as surface soil. The COCs in surface soil samples from the QC Pond were not present above their respective site-specific, risk-based soil screening levels (RBSLs) (Montgomery Watson, 2001). Although low levels of CEMs were detected from water in the pond when it was wet (e.g., 11 ug/L (ppb) of RDX), it is unlikely that there is an exposure pathway from the surface water and sediment contamination to facility workers or on-site human receptors.

Impacts from past releases of contaminants to indoor air are most commonly associated with the volatilization of volatile organic compounds (VOCs) present in ground water or soil beneath or near structures. VOCs are not known to be present in off-site ground water near the facility. VOC

concentrations found in on-site ground water and soil are very low and these detections were not in locations or depths that would be likely to impact existing structures (Montgomery Watson, 2000; Montgomery Watson, 2001).

Impacts from past releases of contaminants to outdoor air are reasonably assumed negligible. This is because VOCs are not present in surface soil at concentrations that exceed RBSLs which include a vapor inhalation pathway. There should be no excess risk posed to current site users from vapors on the surface. Construction workers could be exposed to VOC vapors in a trench. Since there are a limited number of subsurface soil samples that indicated 1,2,4-Trimethylbenzene concentrations greater than the construction worker screening level (Montgomery Watson, 2001), construction workers could be exposed to this compound above the appropriate risk-based threshold (due to the combined ingestion, inhalation and dermal absorption pathways). Workers could also inhale dust containing COCs that were found to exceed soil screening levels in surface and subsurface soil. However, both the cancer and non-cancer risk attributable to inhalation of particles and vapors is many orders of magnitude lower than the risk attributable to direct ingestion of soil. Therefore, the risk posed by inhalation of outdoor air is assumed negligible.

Facility production wells are not impacted with CEMs or other contaminants. Therefore, there is no groundwater exposure pathway to on-site human receptors.

References (Available at the DSHW office):
- Final Revised RFI Work Plan Quality Assurance Program (Volume I) and Field Sampling Program (Volume II), December 1998 (Montgomery Watson).
- Monitoring Well Installation and Groundwater Sampling, Field Program Addendum in October 2000, and Second Phase in March 2001 Montgomery Watson).
- Lysimeter Installation and Vadose Zone Sampling Work Plan Addendum, July 2001 (Montgomery Watson).
- SWMU-Specific Figures and Data Tables from Surface Soil, Soil Boring, and Trenching Locations, July 2000 (Montgomery Watson).
- SWMU-Specific Figures and Data Tables from Supplementary Surface Soil, Soil Boring, and Trenching Locations, May 2001 (Montgomery Watson).
- DSHW's comments and correspondence on EBCO's various work plans, reports and submittals.

2) Off-site Groundwater Contamination and Remediation

Following the failure of the acid ponds that were used to store and evaporate spent nitric acid (containing low levels of CEMs) from explosive production in 1986, EBCO (formerly Trojan Company) conducted investigations of elevated nitrate concentrations present in the Mapleton City municipal and some residential drinking water wells. Since then, EBCO has performed various phases of hydrogeologic investigations in the area of impact in accordance with the provisions of the Consent Agreement between the Utah Division of Water Quality (DWQ) and EBCO under the framework of the Clean Water Act.

Although RDX and other CEMs were likely present in the regional groundwater, these constituents were not detected in private wells, municipal wells and monitoring wells until 1994 after using an improved EPA method for explosive analysis. The area of groundwater impact is approximately three-mile long and one-mile wide. Please note that RCRA corrective action is not addressing off-site groundwater contamination because nitrate in the groundwater is not a hazardous waste and the low levels of CEMs in the groundwater are no longer reactive and therefore are not hazardous wastes.

Since 1998, three granular active carbon (GAC) pump-and-treat systems with a total of five extraction wells have been installed to treat and contain the groundwater plume. The combined total groundwater extraction rate is approximately 2000 to 2500 gpm. Treated groundwater is discharged to Hobble Creek, and is also used as secondary irrigation water for some residents' lawns during summer months. The

discharge water from the three GAC systems is tested every month to ensure that a GAC breakthrough or a treatment system failure has not occurred.

Presently, all residents within the area of impact have stopped using private wells for drinking water. Instead, EBCO has financed connecting all impacted Mapleton residents to the non-impacted Mapleton municipal drinking water system. The DWQ has also sent letters of warning to all impacted residents about the potential risks from using the contaminated groundwater for irrigating, or watering gardens. Therefore, unless the residents have ignored the warning, there should be no direct human exposure from contaminated groundwater in this area.

In addition, based on a thorough telephone survey conducted by DSHW staff in 2004, none of private well owners are currently using contaminated groundwater to irrigate produce or crops (directly consumed by humans). Some residents in the area of contamination are using the contaminated groundwater to water alfalfa consumed by livestock. Based on the currently available information, the potential concentration of RDX in beef from cows fed forage irrigated with contaminated water is judged unlikely to cause adverse health effects in humans. While no direct information is available regarding the accumulation of RDX from feed to cattle to humans, data is available that shows that RDX is metabolized by mammals such as humans and rats (ATSDR Toxicological Profile). Chemicals that are readily metabolized do not bioaccumulate. The potential for RDX to accumulate in beef is judged low because the RDX concentrations in groundwater are low (<30 ug/l), the amount of RDX transferred to plant matter is predicted to be 3 mg/kg, and cattle are presumed to metabolize RDX. Beef cattle are usually fed alternative feeds (e.g., grain) prior to slaughter that would give the cow additional time to depurate if the feed is uncontaminated.

Reference (Available at the DWQ office):

- Corrective Action Plan, July 2001 (under review) (Charter Oak Environmental).

- Hydrology and simulation of ground water flow in the southern Utah and Goshen Valleys, 1995, (Brooks, L.E. and B.J. Stolp):, Utah: United States Geological Survey in cooperation with the Utah Department of Natural Resources Division of Water Rights, Utah DNR Technical Publication No. 111.
- The Geology of North America (Mifflin, M.D.) 1998, Vol. O-2, Hydrogeology, Chapter 8, Region 5, Great Basin: The Geological Society of America.
- Quarterly Reports and 1999 Annual Report for recovery system performance, general water quality, and potentiometric data (Charter Oak Environmental).
- Well Head Protection Plan, 1998 (Charter Oak Environmental).
- R-1, R-2 and Orton-23 Well Construction and Pump Test Reports, 1998 (Charter Oak Environmental).
- Nitrate and RDX Distribution and Fate Report (Charter Oak Environmental).
- Data Collection Plan, 1998 (Charter Oak Environmental).
- An Evaluation of Wastewater Management Alternatives, 1997 (Consulting Environmental Engineering).
- R-3 Well Construction and Pump Test, 1997 (Owens Western Company).
- Supplemental Hydrogeologic Investigation Report, 1996 (Owens Western Company).
- Phases Ia, Ib, II, III and IV Hydrogeologic Investigation Reports, 1992-1995, and Hydrogeologic Investigation Plan 1991 (Owens Western Company).
- Hydogeologic Assessment Program, 1989 and 1990 (Engineering Science).
- A Hydrogeologic Evaluation of the IMC Springville Plant Site, Utah, Phase I (1979); Preliminary Investigation of Waste Management at the IMC Springville Plant, Phase II (1980); A Hydrogeologic Evaluation of the IMC Springville Plant Site, Utah, Phase III (1981); and Hydrogeologic Evaluation of the IMC Springville Plant Site, Utah, Phase IV (1981) (PE LaMoreaux & Associates).

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

	Potential **Human Receptors** (Under Current Conditions)						
"contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	**Yes**	No	No	No	No	No	**Yes**
Air (indoors)	No	No	No	No	No	No	No
Soil (surface, e.g., <2 ft)	No	**Yes**	No	**Yes**	**Yes**	No	No
Surface Water	No	No	No	No	No	No	No
Sediment	No	No	No	No	No	No	No
Soil (subsurface e.g., >2 ft)	No	**Yes**	No	**Yes**	No	No	No
Air (outdoor)	No	No	No	No	No	No	No

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. enter "Yes" or "No" for potential "completeness" under each "contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

Yes If yes (pathways are complete for any "contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

Footnote:
[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

Rationale and Reference(s):

Table 1 lists the rationale and references for potential human exposures from contaminated media (ground water and soil) that exceed acceptable risk levels. As can be seen from the Summary Exposure Pathway Evaluation Table and Table 1, the only potential groundwater exposure to human receptors under current conditions is from livestock feed to cattle and then to human. As explained in the previous rationale and references to Question 2, the available information indicates that the pathway is unlikely to cause adverse health effects in humans.

Contaminated surface and subsurface soils could potentially expose on-site workers (facility employees and construction workers). However, facility routine production activities do not involve the use of areas where soils contain COCs above RBCLs. The facility health and safety plan prohibits workers from entering these areas unprotected.

Table 1. Rationale and References for Potential Human Receptors Under Current Conditions

"contaminated" media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food[3]
Groundwater	*Yes.* *Off-site residents have been supplied with a non-impacted drinking water source. The only potential exposure for off-site residents is through the food pathway (from livestock feed to cattle and then to human.) The available information indicates that the pathway is unlikely to cause adverse health effects in humans. (see Food column).* *EBCO and the Utah Department of Environmental Quality (DEQ) have surveyed ground water use within the affected area. DEQ has contacted residents in the area and has repeatedly advised them not to use impacted ground water for drinking purposes.*	*No.* *The water supply for site workers is not impacted and does not contain Chemical of Concerns (COCs).*	*No.* *It is unlikely that exposure from the deep ground water (known to be impacted by COCs is at least 70 feet below surface) to day-care facilities is complete.* *A review of Utah State day-care licensing records (http://hlunix.hl.state.ut.us/hsi/hfl/cc.htm) showed only two licensed day care facilities in Mapleton. Neither of these was in areas where ground water is impacted by COCs.*	*No.* *The shallowest significant ground water known to be impacted by COCs is at least 70 feet below surface. There is little or no reasonable opportunity for construction workers to contact ground water at this depth.*	*No.* *There is no reasonable means for a trespasser to contact impacted ground water*	*No.* *There is no reasonable means for a recreationist to contact impacted ground water.*	*Yes.* *Off-site residents with private wells located where ground water is impacted by COCs are irrigating crops, alfalfa, e.g., that will be fed to livestock. The only potential groundwater exposure to human receptors under current conditions is from livestock feed to cattle and then to humans. The available information indicates that the pathway is unlikely to cause adverse health effects in humans.*

Table 1 continued. Rationale and References for Potential Human Receptors Under Current Conditions

"contaminated" media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food[3]
Soil (surface, e.g. < 2 ft)	*No.* *Impacted soils are only known to exist on site.*	*Yes.* *On-site workers may enter areas where surface soils are impacted with COCs. RFI sampling results indicate that soil contamination at approximately six SWMUs may exceed in surface soils the industrial risk screening levels established in the RFI work plan, such as, SWMUs 1, 5, 6, 18, 30 and 31. SWMUs 5 and 6 are close to current facility production areas where workers must wear personal protective clothing and equipment.*	*No.* *Impacted soils are only known to exist on site. There is no day-care facility on site.*	*Yes.* *On-site construction workers may work in areas where surface soils are impacted with COCs.*	*Yes.* *Trespassers could enter the wastewater dispersion area of SWMU 1. Access by trespassers to other areas with impacted soils is adequately restricted by the facility fence and regular security patrols.*	*No.* *A recreationist could enter the wastewater dispersion area of SWMU 1. However, this would be trespassing, so this potential entry is covered under the "trespasser" column.*	*No.* *Impacted soils are only known to exist on site. There is no production of food crops on site.*

Table 1 continued. Rationale and References for Potential Human Receptors Under Current Conditions

"contaminated" media	Residents	Workers	Day-Care	Construction	Trespasser	Recreation	Food[3]
Soil (subsurface, e.g>2ft)	*No.* *Impacted soils are only known to exist on site.*	*Yes.* *Regular production activity by site workers does not involve coming in contact with subsurface soils. However, the nitrostarch layer in SMWU 26 could pose a reactivity/ ignitability hazard to workers in close proximity.*	*No.* *Impacted soils are only known to exist on site. There is no day-care facility on-site.*	*Yes.* *On-site construction workers may work in areas where subsurface soils are impacted with COCs. Also, construction workers could work in areas where the presence of nitrostarch poses a reactivity/ ignitability hazard.*	*No.* *There is no reasonable scenario where a trespasser could contact subsurface soil. Also, site security is adequate to restrict access to the nitrostarch areas (SWMU 26 and 27).*	*No.* *There is no reasonable scenario where a recreationist could contact subsurface soil.*	*No.* *Impacted soils are only known to exist on site. There is no production of food crops on site. Furthermore, the root zone of most food crops would typically be less than two feet.*

4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be sss **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "level" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "level") could result in greater than acceptable risks)?

__**No**__ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable"exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

Rationale and Reference(s):

As mentioned in Question 2 of the EI form, there are two different potential human receptors, off-site and on-site receptors, which are considered for this EI.

(1) Off-site human receptors are residents within the area of the groundwater impact. Through an ongoing institutional controls program, impacted residents have been provided with clean drinking water sources to their houses, and they have also been advised not to use their own well water for drinking water purposes. Through periodic monitoring of the institutional controls program, it has been ascertained that potential uses of impacted ground water by off-site residents is limited to irrigation of lawns and gardens under current conditions. Currently, only potential groundwater exposure to human receptors is from livestock feed to cattle and then to humans. As explained in the previous rationale and references to Question 2, the available information indicates that the pathway is unlikely to cause adverse health effects in humans. Therefore, all potential exposures cannot be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway.

(2) On-site human receptors are facility employees and construction workers. The following are rationales and references as to why exposure cannot be reasonably expected to be significant for on-site workers through only those pathways indicated as potentially complete. A "YE" status code can be entered for on-site human receptors.

(a) Surface Soil (<2 feet)

RFI sampling results indicate that surface soil contamination at approximately six SWMUs may exceed the industrial risk-based screening levels (RBSLs) established in the RFI work plan. EBCO has an internal site health and safety plan that restricts personal access to areas where soil are knows to be contaminated. EBCO has also proposed interim remedial measures at some of these SWMUs, such as,

SWMUs 5 and 6 that are close to the current facility production areas. No detailed work plans or schedules have been proposed to accomplish these remedial measures. Final remedies as part of EBCO RFI activities will address the RCRA corrective action program's overall long-term mission to protect human health and the environment.

Workers: Routine production activities do not involve the use of areas where surface soils contain COCs above industrial-worker risk-based screening levels (RBSLs). Worker access to these contaminated areas is restricted by the facility health and safety plan. Entry into these areas is typically limited to HAZMAT trained workers with the knowledge and equipment to adequately control exposure to COCs. The time any non-HAZMAT workers spend in the area would be far below the exposure time assumed in the calculation of the industrial-worker RBSLs (8 hours/day and 250 days/year for 25 years). Therefore, the potential exposure and associated risk for non-HAZMAT workers is assumed to be very low.

Construction: There is no ongoing or planned construction work in areas that contain COCs above construction-worker RBSLs. In the unlikely case that construction were to be performed in such areas prior to soil remediation, the construction activities would be performed by HAZMAT trained workers with the knowledge and equipment to adequately control exposure to COCs.

Trespassers: The only area currently impacted by COCs that could reasonably be accessed by a trespasser is the wastewater dispersion area (SWMU 1). Access to this area is controlled by a low barbwire fence with "no trespassing" signs. However, a trespasser could access this area. The remainder of the facility is protected by a six-foot chain-link fence topped with three strands of barbwire. SWMU 1 is patrolled periodically by site security personnel and trespasser entry into this area has not been reported.

Site-specific risk based screening levels for trespassers have not been calculated. However, the cumulative risk indices calculated for SWMU 1 are less than three times the acceptable levels for a site worker. The exposure time assumptions for the site-worker RBSL (250 days/year for 25 years) is far greater than the exposure time that could reasonably be expected for a trespasser and more than off-sets the exposure represented by the soil concentrations alone. Therefore, the potential exposure and associated risk for a trespasser is assumed to be very low.

(b) Subsurface Soil (>2 feet)

Workers: Subsurface soil sampling indicates a potential risk to site workers from the presence of potentially reactive concentrations of nitrostarch in SMWU 26 and SMWU 27. Although site workers would not directly contact this material, a reactivity/ignitability hazard could exist to workers in close proximity to the nitrostarch areas. This hazard has been mitigated through establishing a no-entry zone around the nitrostarch areas and maintaining adequate escape routes. The no-entry zones and escape routes are reinforced through worker training.

Construction: There is no ongoing or planned construction work in areas that contain COCs above construction-worker RBSLs. In the unlikely case that construction were to be performed in such areas prior to soil remediation, the construction activities would be performed by HAZMAT trained workers with the knowledge and equipment to adequately control exposure to COCs. Construction work is not permitted in areas containing potentially reactive/ignitable concentrations of nitrostarch (partial SWMUs 26 and 27). The prohibition on construction work in these areas is reinforced through employee training.

5 Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

__**YE**__ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

YE - all "significant" exposures from the groundwater to off-site residents have been shown to be within acceptable limits.

Also, all "significant" exposures from contaminated soils to on-site workers have been shown to be within acceptable limits. Facility routine production activities do not involve the use of the contaminated areas above the RBSLs. The facility safety plan also prohibits on-site workers from entering, without adequate protections, the areas of contamination that exceed the RBSLs. However, in accordance with R315-101 of Utah Administrative Code, EBCO is required to conduct appropriate site management activities including remedial actions, if necessary, to mitigate risks exceeding RBSLs to on-site workers. According to the approved RFI work plan, EBCO will propose detailed work plans on how to meet this requirement.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_YE__ YE - Yes, "Current Human Exposures Under Control"has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at **The Ensign-Bickford Company** facility , EPA ID **# UTD041310962**, located at **8305 South Highway 6, Spanish Fork, Utah** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination

(Note that an "IN" is entered because environmental exposures to off-site residents are currently under review. An "YE" code is appropriate for on-site workers at this time.)

Completed by (signature) _____ Date September 17, 2004
(print) Hao Zhu
(title) Environmental Engineer

Supervisor (signature) _____ Date September 17, 2004
(print) Brad Maulding
(title) Section Manager
(EPA Region or State) Utah DEQ

Locations where References may be found:

1) Off-site groundwater:
Utah Division of Water Quality
Cannon Health Building, 3rd Floor
288 North 1460 West
Salt Lake City, UT 84114-4870

2) On-site RFI activities:
Utah Division of Solid and Hazardous Waste
Cannon Health Building, 4th Floor
288 North 1460 West
Salt Lake Cit, UT 84114-4880

Contact telephone and e-mail numbers

(name) Hao Zhu (at the DSHW office)
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